

MITSUBISHI

GT16

General Description

**GT1695M-XTBA
GT1695M-XTBD
GT1685M-STBA
GT1685M-STBD
GT1675M-STBA
GT1675M-STBD
GT1675M-VTBA
GT1675M-VTBD
GT1665M-STBA
GT1665M-STBD
GT1665M-VTBA
GT1665M-VTBD**

Thank you for purchasing the GOT1000 Series.

Prior to use, please read both this manual and detailed manual thoroughly to fully understand the product.

MODEL	GT16-U(HW)
MODEL CODE	1D7M79
IB(NA)-0800434-C(0901)MEE	

GRAPHIC OPERATION TERMINAL

GOT1000

● SAFETY PRECAUTIONS ●

(Always read these precautions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product.

In this manual, the safety precautions are ranked as "DANGER" and "CAUTION".



Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the caution level may lead to a serious accident according to the circumstances.
Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[DESIGN PRECAUTIONS]



- Some failures of the GOT, communication unit or cable may keep the outputs on or off. An external monitoring circuit should be provided to check for output signals which may lead to a serious accident. Not doing so can cause an accident due to false output or malfunction.
- If a communication fault (including cable disconnection) occurs during monitoring on the GOT, communication between the GOT and PLC CPU is suspended and the GOT becomes inoperative.
For bus connection : The CPU becomes faulty and the GOT becomes inoperative.
For other than bus connection : The GOT becomes inoperative.
A system where the GOT is used should be configured to perform any significant operation to the system by using the switches of a device other than the GOT on the assumption that a GOT communication fault will occur.
Not doing so can cause an accident due to false output or malfunction.
- Do not use the GOT as the warning device that may cause a serious accident.
An independent and redundant hardware or mechanical interlock is required to configure the device that displays and outputs serious warning.
Failure to observe this instruction may result in an accident due to incorrect output or malfunction.
- Incorrect operation of the touch switch(s) may lead to a serious accident if the GOT backlight is gone out. When the GOT backlight goes out, the POWER LED flickers (green/orange) and the display section turns black and causes the monitor screen to appear blank, while the input of the touch switch(s) remains active. This may confuse an operator in thinking that the GOT is in "screensaver" mode, who then tries to release the GOT from this mode by touching the display section, which may cause a touch switch to operate.
Note that the following occurs on the GOT when the backlight goes out.
 - The POWER LED flickers (green/orange) and the monitor screen appears blank
- The display section of the GT16 is an analog-resistive type touch panel.
If you touch the display section simultaneously in 2 points or more, the switch that is located around the center of the touched point, if any, may operate.
Do not touch the display section in 2 points or more simultaneously.
Doing so may cause an accident due to incorrect output or malfunction.
- When programs or parameters of the controller (such as a PLC) that is monitored by the GOT are changed, be sure to reset the GOT or shut off the power of the GOT at the same time.
Not doing so can cause an accident due to false output or malfunction.

[DESIGN PRECAUTIONS]

CAUTION

- Do not bundle the control and communication cables with main-circuit, power or other wiring. Run the above cables separately from such wiring and keep them a minimum of 100mm apart. Not doing so noise can cause a malfunction.
- Do not press the GOT display section with a pointed material as a pen or driver. Doing so can result in a damage or failure of the display section.

[MOUNTING PRECAUTIONS]

DANGER

- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the GOT main unit to/from the panel.
Not doing so can cause the unit to fail or malfunction.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the communication unit, option function board onto/from the GOT.
Not doing so can cause the unit to fail or malfunction.
- When installing the option function board, wear an earth band etc. to avoid the static electricity.
Not doing so can cause a unit corruption.

CAUTION

- Use the GOT in the environment that satisfies the general specifications described in this manual.
Not doing so can cause an electric shock, fire, malfunction or product damage or deterioration.
- When mounting the GOT to the control panel, tighten the mounting screws in the specified torque range.
Undertightening can cause the GOT to drop, short circuit or malfunction.
Overtightening can cause a drop, short circuit or malfunction due to the damage of the screws or the GOT.
- When loading the communication unit to the GOT, fit it to the connection interface of the GOT and tighten the mounting screws in the specified torque range.
Under tightening can cause the GOT to drop, short circuit or malfunction.
Overtightening can cause a drop, failure or malfunction due to the damage of the screws or unit.
- When mounting the option function board onto the GOT, connect it to the corresponding connector securely and tighten the mounting screws within the specified torque range.
Undertightening can cause malfunction due to poor contact.
Overtightening can cause malfunction due to screw or unit damage.
- When inserting a CF card into the GOT, push it into the insertion slot until the CF card eject button will pop out.
Failure to do so may cause a malfunction due to poor contact.

[MOUNTING PRECAUTIONS]

CAUTION

- When inserting/removing a CF card into/from the GOT, turn the CF card access switch off in advance. Failure to do so may corrupt data within the CF card.
- When removing a CF card from the GOT, make sure to support the CF card by hand, as it may pop out. Failure to do so may cause the CF card to drop from the GOT and break.
- When installing a USB memory to the GOT, make sure to install the USB memory to the USB interface firmly. Failure to do so may cause a malfunction due to poor contact.
- Before removing the USB memory from the GOT, operate the utility screen for removal. After the successful completion dialog box is displayed, remove the memory by hand carefully. Failure to do so may cause the USB memory to drop, resulting in a damage or failure of the memory.
- For closing the USB environmental protection cover, fix the cover by pushing the Δ mark on the latch firmly to comply with the protective structure.
- Remove the protective film of the GOT. When the user continues using the GOT with the protective film, the film may not be removed.
- Operate and store the GOT in environments without direct sunlight, high temperature, dust, humidity, and vibrations.

[WIRING PRECAUTIONS]

DANGER

- Be sure to shut off all phases of the external power supply used by the system before wiring. Failure to do so may result in an electric shock, product damage or malfunctions.

CAUTION

- Always ground the FG terminal, LG terminal, and protective ground terminal of the GOT power to the protective ground conductors dedicated to the GOT.
- Not doing so may cause an electric shock or malfunction. Terminal screws which are not to be used must be tightened always at torque 0.5 to 0.8 N·m. Otherwise there will be a danger of short circuit against the solderless terminals.
- Use applicable solderless terminals and tighten them with the specified torque. If any solderless spade terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Correctly wire the GOT power supply section after confirming the rated voltage and terminal arrangement of the product. Not doing so can cause a fire or failure.
- Tighten the terminal screws of the GOT power supply section in the specified torque range. Undertightening can cause a short circuit or malfunction. Overtightening can cause a short circuit or malfunction due to the damage of the screws or the GOT.
- Exercise care to avoid foreign matter such as chips and wire offcuts entering the GOT. Not doing so can cause a fire, failure or malfunction.
- The module has an ingress prevention label on its top to prevent foreign matter, such as wire offcuts, from entering the module during wiring. Do not peel this label during wiring. Before starting system operation, be sure to peel this label because of heat dissipation.

[WIRING PRECAUTIONS]

CAUTION

- Plug the communication cable into the connector of the connected unit and tighten the mounting and terminal screws in the specified torque range.
Undertightening can cause a short circuit or malfunction.
Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.
- Plug the QnA/ACPU/Motion controller(A series) bus connection cable by inserting it into the connector of the connected unit until it "clicks".
After plugging, check that it has been inserted snugly.
Not doing so can cause a malfunction due to a contact fault.

[TEST OPERATION PRECAUTIONS]

DANGER

- Before performing the test operations of the user creation monitor screen (such as turning ON or OFF bit device, changing the word device current value, changing the settings or current values of the timer or counter, and changing the buffer memory current value), read through the manual carefully and make yourself familiar with the operation method.
During test operation, never change the data of the devices which are used to perform significant operation for the system.
False output or malfunction can cause an accident.

[STARTUP/MAINTENANCE PRECAUTIONS]

DANGER

- When power is on, do not touch the terminals.
Doing so can cause an electric shock or malfunction.
- Correctly connect the battery connector.
Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire.
Doing so will cause the battery to produce heat, explode, or ignite, resulting in injury and fire.
- Before starting cleaning or terminal screw retightening, always switch off the power externally in all phases.
Not switching the power off in all phases can cause a unit failure or malfunction.
Undertightening can cause a short circuit or malfunction.
Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.

CAUTION

- Do not disassemble or modify the unit.
Doing so can cause a failure, malfunction, injury or fire.
- Do not touch the conductive and electronic parts of the unit directly.
Doing so can cause a unit malfunction or failure.
- The cables connected to the unit must be run in ducts or clamped.
Not doing so can cause the unit or cable to be damaged due to the dangling, motion or accidental pulling of the cables or can cause a malfunction due to a cable connection fault.
- When unplugging the cable connected to the unit, do not hold and pull the cable portion.
Doing so can cause the unit or cable to be damaged or can cause a malfunction due to a cable connection fault.

[STARTUP/MAINTENANCE PRECAUTIONS]

CAUTION

- Do not drop the module or subject it to strong shock. A module damage may result.
- Do not drop or give an impact to the battery mounted to the unit.
Doing so may damage the battery, causing the battery fluid to leak inside the battery.
If the battery is dropped or given an impact, dispose of it without using.
- Before touching the unit, always touch grounded metals, etc. to discharge static electricity from human body, etc.
Not doing so can cause the unit to fail or malfunction.

[BACKLIGHT CHANGING PRECAUTIONS]

DANGER

- Before changing the backlight, always switch off the GOT power externally in all phases (when the GOT is connected to the bus, the PLC CPU power must also be switched off externally in all phases) and remove the GOT from the control panel.
Not switching the power off in all phases may cause an electric shock.
Not removing the unit from the control panel can cause injury due to a drop.

CAUTION

- When replacing the backlight, use the gloves.
Otherwise, it may cause you to be injured.
- Start changing the backlight more than 5 minutes after switching the GOT power off.
Not doing so can cause a burn due to the heat of the backlight.

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of this product, treat it as industrial waste.
When disposing of batteries, separate them from other wastes according to the local regulations.
(Refer to GT16 User's Manual for details of the battery directive in the EU member states.)

[TRANSPORTATION PRECAUTIONS]

CAUTION

- When transporting lithium batteries, make sure to treat them based on the transport regulations.
(Refer to GT16 User's Manual for details of the regulated models.)
- Make sure to transport the GOT main unit and/or relevant unit(s) in the manner they will not be exposed to the impact exceeding the impact resistance described in the general specifications of the GT16 User's Manual, as they are precision devices.
Failure to do so may cause the unit to fail.
Check if the unit operates correctly after transportation.

REVISIONS

* The manual number is noted at the lower right of the top cover.

Print Date	*Manual Number	Revision
Aug., 2008	IB(NA)-0800434-A	First edition
Nov., 2008	IB(NA)-0800434-B	<div style="border: 1px solid black; padding: 2px;">Partial corrections</div> <div style="border: 1px solid black; padding: 2px;">Section 2.1, Section 2.2, Section 3.1</div> <div style="border: 1px solid black; padding: 2px;">Partial additions</div> <div style="border: 1px solid black; padding: 2px;">SAFETY PRECAUTIONS, Section 3.1</div>
Jan., 2009	IB(NA)-0800434-C	<div style="border: 1px solid black; padding: 2px;">Partial corrections</div> <div style="border: 1px solid black; padding: 2px;">SAFETY PRECAUTIONS, Section 2.1</div> <div style="border: 1px solid black; padding: 2px;">Partial additions</div> <div style="border: 1px solid black; padding: 2px;">Packing List, Section 3.2</div>

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Manuals

The following shows manuals relevant to this product.

Detailed Manual

Manual name	Manual Number (Model code)
GT16 User's Manual (Sold separately)	SH-080778ENG (1D7M88)

Relevant Manual

For relevant manuals, refer to the PDF manuals stored in the GT Designer2 CD-ROM.

- * Before using the GOT, connect the connector of the GOT to the battery connector.
- * For details on GT16 specifications, installing procedure, EMC Directive, wiring, maintenance and inspection, or checking method for the version and the compatible standard, refer to GT16 User's Manual.

Packing List

The GOT product package includes the following:

Model name	Product	Quantity
GT1695M-X	GOT	1
	Installation fitting	8
GT1685M-S GT1675M-S GT1675M-V GT1665M-S GT1665M-V	GOT	1
	Installation fitting	4

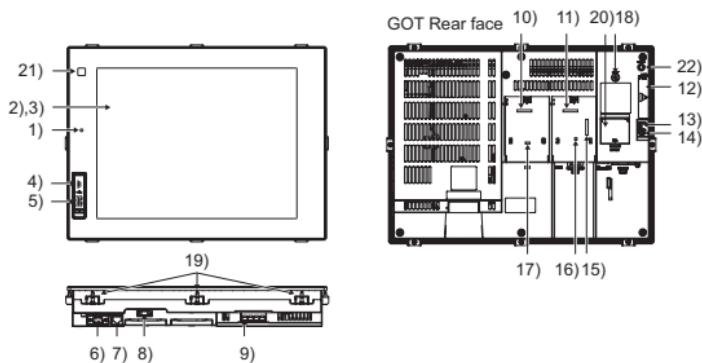
1.Features

- (1) Improved monitoring performance and connectivity to FA devices
 - Using of TFT color liquid crystal display (high intensity, wide angle view and high definition type) provides clear full-color display and displays small characters clearly. (Displays digital images of BMP and other formats in 65536 colors.)
 - Provides multi-language display function based on Unicode2.1 True Type font and high-speed drawing of beautiful text.
 - High speed monitoring through high speed communication at maximum of 115.2kbps.
 - High speed display and high speed touch switch response.
 - The operation performance is improved by the analog touch panel.
 - All models of the video/RGB unit and the multimedia unit are applicable.
- (2) More efficient GOT operations including screen design, startup, adjustment, management and maintenance works
 - 15MB user memory is included as standard.
 - The RS-232 interface is included as standard.
 - The RS-422/485 interface is included as standard.
 - The CF card interface is included as standard.
 - The Ethernet interface is included as standard.
 - Font installation is available to increase the system fonts.
 - Combined use of 4 types of alarms (system alarm, user alarm, alarm history, alarm popup display) realizes more efficient alarm notification.
 - Maintenance timing report function is available that measures the backlight energization time and notifies of maintenance time.
 - The USB interface is positioned on the GOT front. This enables the system startup to be performed more efficiently using FA device startup tool, and eliminates the necessity of indirect works (opening and closing the control panel, cable replacement, cable rewiring) in order to improve the working efficiency.
 - The blown backlight bulb can be confirmed even during screen saving, with the blinked POWER LED at backlight shutoff detection.
- (3) Enhanced support of FA device setup tools
 - Transferring and monitoring sequence programs with the personal computer connected to the GOT can be executed when connecting to a PLC CPU with the direct CPU connection or bus connection. (FA transparent function)

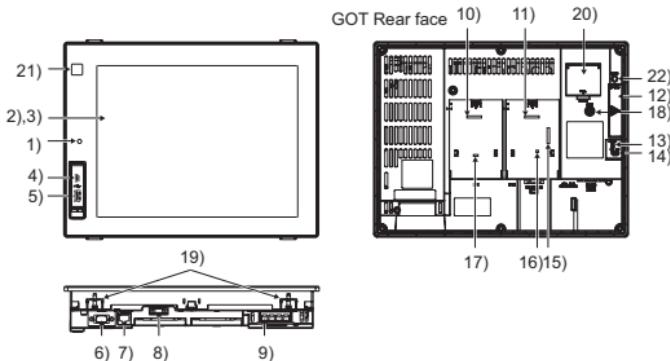
2. Part Names

2.1 Part Names and Settings of the GT16□□

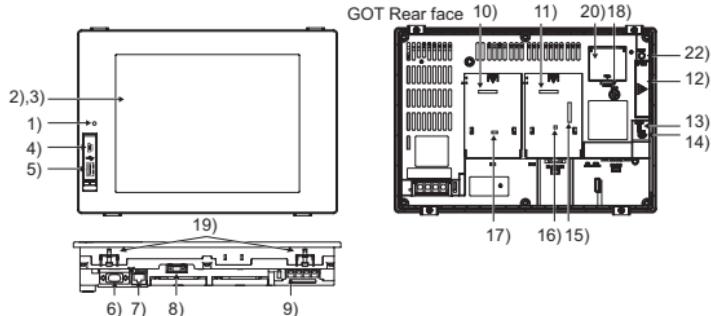
GT1695

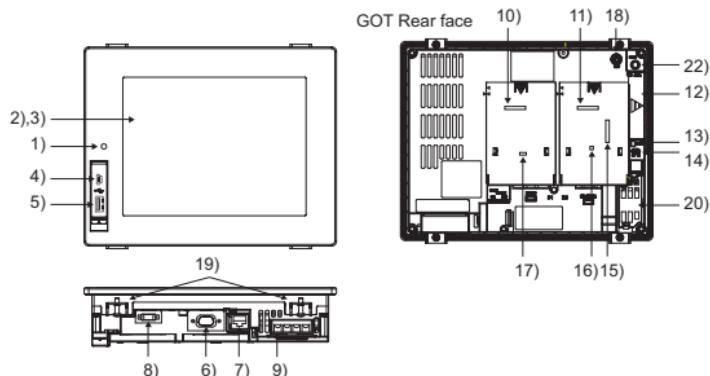


GT1685



GT1675





No.	Name	Description
1)	POWER LED	Lit in green : Power is correctly supplied Lit in orange : Screen saving Blinks in orange/green: Blown back light bulb Not lit : Power is not supplied
2)	Display screen	Displays the Utility and the user creation screen.
3)	Touch key	For operating touch switches in the Utility and the user creation screen
4)	USB interface (Device)	For connecting a personal computer (Connector type: MINI-B)
5)	USB interface (Host)	For data transfer and storage (Connector type: TYPE-A)
6)	RS-232 interface	For communicating with a controller or connecting a personal computer (Connector type: D sub 9-pin)
7)	Ethernet interface	For communicating with a controller or using the gateway function (Connector type: RJ-45 (modular jack))
8)	RS-422/485 interface	For communicating with a controller (Connector type: 14-pin (female))
9)	Power terminal	Power input terminal, LG terminal, FG terminal
10)	Extension interface1	For installing an extension unit (I/F-1)
11)	Extension interface2	For installing an extension unit (I/F-2)
12)	CF card interface	For installing a CF card
13)	CF card access LED	Lit :CF card accessed Not lit :CF card not accessed
14)	CF card access switch	Used for accepting or stopping the access to the CF card before removing the CF card from the GOT ON :CF card being accessed (CF card removal prohibited) OFF :CF card not accessed (CF card removal possible)
15)	Video/RGB interface	For mounting the video input unit, RGB input unit, video/RGB input unit, RGB output unit, or multimedia unit
16)	Terminating resistor setting switch	For switching on and off of the terminating resistor for the RS-422/485 communication port
17)	Optional function board interface	For installing the optional function board
18)	Reset switch	Hardware reset switch (Inoperative in the bus connection or with the bus connection unit installed)
19)	Hole for unit installation fitting	Hole for inserting the unit installation fitting
20)	Battley holder	Houses the battery
21)	Human sensor	Sensor that detects human movement
22)	Installation switch	Used for OS installations at the GOT startup

3.Specifications

3.1 General Specifications

Item	Specifications										
Operating ambient temperature ^{*1}	Display section	0 to 50°C									
	Other than the display section	0 to 55°C									
Storage ambient temperature	-20 to 60°C										
Operating ambient humidity ^{*5}	10 to 90% RH, non-condensing										
Storage ambient humidity	10 to 90% RH, non-condensing										
Vibration resistance	Compliant with JIS B3502 and IEC61131-2	Under intermittent vibration	Frequency	Acceleration	Half-amplitude	Sweep count					
			5 to 9Hz	-	3.5mm	10 times each in X, Y and Z directions					
			9 to 150Hz	9.8m/s ²	-						
			Under continuous vibration	5 to 9Hz	1.75mm						
			9 to 150Hz	4.9m/s ²	-						
Shock resistance	Compliant with JIS B3502 and IEC61131-2 (147 m/s ² , 3 times each in X, Y and Z directions)										
Operating atmosphere	No corrosive gas										
Operating altitude ^{*2}	2000 m (6562 ft) max.										
Installation location	Inside control panel										
Overvoltage category ^{*3}	II or less										
Pollution degree ^{*4}	2 or less										
Cooling method	Self-cooling										
Grounding	Grounding with a resistance of 100Ω or less										

^{*1} When mounting a multimedia unit (GT16M-MMR), MELSECNET/H communication unit (GT15-J71LP23-25, GT15-J71BR13), or CC-Link communication unit (GT15-J61BT13), the operating ambient temperature must be reduced 5 °C against the maximum values described in general specifications.

When using the GOT with a fingerprint unit (GT15-80FPA) mounted, the operating ambient temperature must be in the range of 0 to 40°C.

^{*2} Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0m (0ft.). Failure to observe this instruction may cause a malfunction.

When an air purge is made inside the control panel by adding pressure, there may be a clearance between the surface sheet and the screen making it difficult to use the touch panel, or the sheet may come off.

^{*3} This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within the premises.

Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.

^{*4} This index indicates the degree to which conductive material is generated in the environment where the equipment is used.

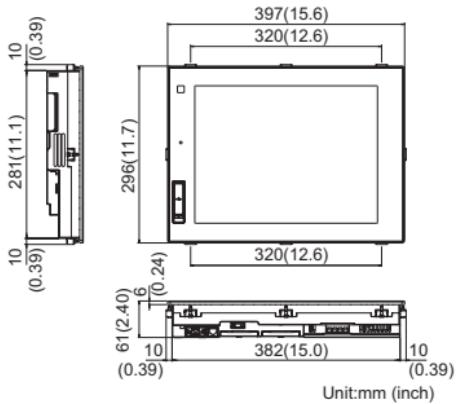
In pollution degree 2, only non-conductive pollution occurs but temporary conductivity may be produced due to condensation.

^{*5} When using the GOT with a fingerprint unit (GT15-80FPA) mounted, the operating ambient humidity must be in the range of 10 to 85%RH and there must be no condensation.

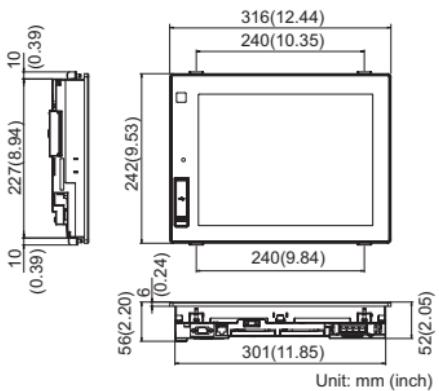
Point	
Refer to GT16 User's Manual for details of the performance specifications of each GOT.	

3.2 External Dimensions

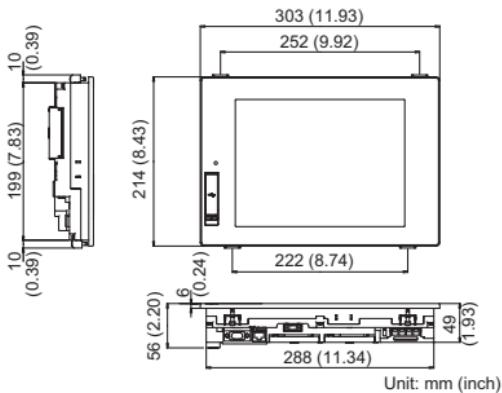
(1) GT1695



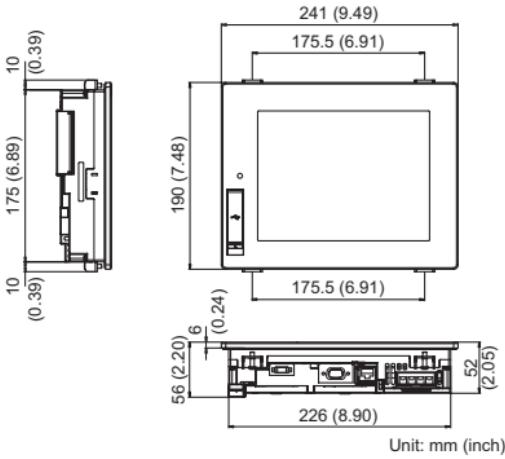
(2) GT1685



(3) GT1675



(4) GT1665



Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

Country/Region	Sales office/Tel	Country/Region	Sales office/Tel
U.S.A	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061, U.S.A. Tel : +1-847-478-2100	Hong Kong	Mitsubishi Electric Automation (Hong Kong) Ltd. 10th Floor, Manulife Tower, 169 Electric Road, North Point, Hong Kong Tel : +852-2887-8870
Brazil	MELCO-TEC Rep. Com.e Assessoria Tecnica Ltda. Rua Correia Dias, 184, Edificio Paraiso Trade Center-8 andar Paraiso, Sao Paulo, SP Brazil Tel : +55-11-5908-8331	China	Mitsubishi Electric Automation (Shanghai) Ltd. 4/F Zhi Fu Plaza, No.80 Xin Chang Road, Shanghai 200003, China Tel : +86-21-6120-0808
Germany	Mitsubishi Electric Europe B.V. German Branch Gothaer Strasse 8 D-40880 Ratingen, GERMANY Tel : +49-2102-486-0	Taiwan	Setsuyo Enterprise Co., Ltd. 6F No.105 Wu-Kung 3rd.Rd, Wu-Ku Hsiang, Taipei Hsine, Taiwan Tel : +886-2-2299-2499
U.K	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Hertfordshire., AL10 8XB, U.K. Tel : +44-1707-276100	Korea	Mitsubishi Electric Automation Korea Co., Ltd. 1480-6, Gayang-dong, Gangseo-ku Seoul 157-200, Korea Tel : +82-2-3660-9552
Italy	Mitsubishi Electric Europe B.V. Italian Branch Centro Dir. Colleoni, Pal. Perseo-Ingr.2 Via Paracelso 12, I-20041 Agrate Brianza., Milano, Italy Tel : +39-039-60531	Singapore	Mitsubishi Electric Asia Pte, Ltd. 307 Alexandra Road #05-01/02, Mitsubishi Electric Building, Singapore 159943 Tel : +65-6470-2460
Spain	Mitsubishi Electric Europe B.V. Spanish Branch Carretera de Rubí 76-80, E-08190 Sant Cugat del Valles, Barcelona, Spain Tel : +34-93-565-3131	Thailand	Mitsubishi Electric Automation (Thailand) Co., Ltd. Bang-Chai Industrial Estate No.111 Moo 4, Serithai Rd, T.Kannayao, A.Kannayao, Bangkok 10230 Thailand Tel : +66-2-517-1326
France	Mitsubishi Electric Europe B.V. French Branch 25, Boulevard des Bouvets, F-92741 Nanterre Cedex, France TEL: +33-1-5568-5568	Indonesia	P.T. Autoteknido Sumber Makmur Muara Karang Selatan, Block A/Utara No.1 Kaw. No.11 Kawasan Industri Pergudangan Jakarta - Utara 14440, P.O.Box 5045 Jakarta, 11050 Indonesia Tel : +62-21-6630833
South Africa	Circuit Breaker Industries Ltd. Private Bag 2016, ZA-1600 Isando, South Africa Tel : +27-11-928-2000	India	Messung Systems Pvt, Ltd. Electronic Sadan NO:III Unit No15, M.I.D.C Bhosari, Pune-411026, India Tel : +91-20-2712-3130
		Australia	Mitsubishi Electric Australia Pty. Ltd. 348 Victoria Road, Rydalmerle, N.S.W 2116, Australia Tel : +61-2-9684-7777



HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14, YADA-MINAMI 5-CHOME, HIGASHI-KU, NAGOYA, JAPAN

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